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ABSTRACT

To determine how employers select and train employees and the implications of this behavior for schools, telephone interviews were conducted with more than 3,500 employers. These employers answered questions on the number of persons who applied for the last position for which they hired prior to August, 1981; the number of applicants interviewed; the hours spent recruiting, screening, and interviewing applicants for the position; and the number of offers made. Some of the findings were that firms that have many job applicants conduct more extensive searches (see more applicants and conduct more interviews) than firms that do not receive many job applications and that their cost of conducting an extensive search is lower. Therefore, these employers tend to rely on extensive search methods rather than intensive search (finding out more about each applicant). On the whole, larger firms spent more time on each hiring than smaller firms. Additional time spent on searching correlated positively to the amount of cost associated with firing employees who are mistakenly hired. The study also found that employers seldom invest in all of the employee recruitment channels that are available to them, preferring instead to use informal recruitment mechanisms. Some of the reasons for this are that labor markets are not perfect, skills are often specific to certain companies, and it is costly to obtain information about the competence of job applicants. In addition, the study found that employers usually offer front-loaded compensation in order to attract workers if they are not likely to quit later. (KC)

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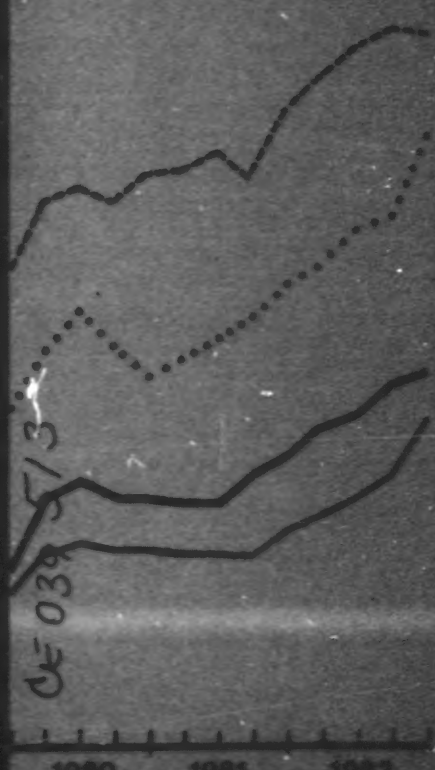
HIRING AND TRAINING WORKERS

EXECUTIVE SUMMARY



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HIRING AND TRAINING WORKERS:

EXECUTIVE SUMMARY

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FOREWORD

Very little is known about the character of employer selection and training policies and how they interface with schools. To address these and other issues, the National Center for Research in Vocational Education commissioned the Gallup Organization to conduct telephone interviews with over 3,500 employers. This report is one of a series of papers analyzing how employers select and train employees and the implications of their behavior for schools.

We wish to express our gratitude to the National Institute of Education for funding the data collection effort that provided the database for this study and its' support of the analysis presented in this report. We wish to also thank Ron Bucknam who served as institutional monitor for his guidance and support. We wish to acknowledge the support from the National Commission for Employment Policy, Department of Labor, and the Swedish Institute for Social Research for earlier stages of this research.

This research would not have been possible without the cooperation and assistance of 3,500 employers who so graciously responded to our telephone interview. We greatly appreciate the time and the insights that these very busy men and women contributed to the study.

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Thanks are extended to the staff at the Gallup Organization who supervised the telephone survey: Mitchell Cohen, Nancy Nygreen, Peggy Ashton, and Corinne Kyle. Reviewers of an earlier draft of this report: John McCall, Masanori Hashimoto, Lawrence Kahn, Dale Mortensen, John Gardner, and Kevin Hollenbeck made many helpful suggestions. Terrence Davey did the programming and database preparation; the manuscript was edited by Judy Balogh and Janet Kiplinger of the National Center's editorial staff; and it was typed by Cathy Jones, Colleen Kinzelman, and Vera Mueller. A comprehensive technical report on this research is available.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

HIRING AND TRAINING WORKERS:

EXECUTIVE SUMMARY

EXTENSIVE SEARCH, INTENSIVE SEARCH, AND HIRING COSTS

The recruitment, screening, and evaluation process that precedes a hiring selection is an information gathering process. Since the collection and processing of information is costly, the amount and character of the firm's investment in information depends upon a calculation of costs and benefits. The benefit being sought is the selection of the best possible worker. To the employer, the true present value of labor services offered by a new employee is a random variable whose distribution can be changed by the acquisition of information. A positive recommendation from another employer or a teacher may cause the expected value of the distribution to increase and the uncertainty surrounding its mean to decrease. Conversely, a negative letter of recommenuation may cause the expected value to decrease.

An employer survey sponsored by the National Institute of Education and the National Center for Research in Vocational Education that was conducted between February and June 1982 provides the basis for analyzing employer search and hiring costs. Each employer surveyed was asked about the screening and interviewing activity associated with the last employee hired prior to August 1981. The 2,264 employers who provided answers to a series of questions concerning the last person hired make up the sample of employers whose hiring activity is to be examined. These employers answered questions on the number of individuals who applied for the position, the number interviewed; the hours spent recruiting, screening, and interviewing applicants for the position and the number of offers made.

Since the information set used to make the hiring selections is subject to the firm's control, there are really two margins or dimensions of search investment. The employer has each job seeker fill out an application form, which the employer then screens to make a preliminary judgement about whether to invest in more information about this candidate by arranging an interview or contacting references. As Rees (1966) states, "A buyer can search at the extensive margin by getting a quotation from one more seller. He can search

at the intensive margin by getting additional information concerning an offer already received" (p. 560). First, there is an extensive margin. A good proxy for the extent of search is the number of applicants evaluated per job offer. The extent of a firm's search is determined by policies like the following: whether ads are placed in the paper; whether and from where referrals are requested; how long the search process is allowed to continue; and whether job applications are accepted when there are no immediate vacancies, and then reviewed when an opening occurs. The extent of search can be empirically decomposed into two components: (1) the number of applicants seen per interview, and (2) the number of interviews per offer. Table 1-1 presents the above measures of extensive search categorized by employers' industrial classification and by the occupation of the position filled. It indicates significant differences in extensive search across positions in different occupations or employers in different industries. Manufacturing employers typically engage in the most extensive search. Mining and construction companies engage in the least extensive search. The extent of search seems to be greatest for clerical jobs and least for professional, technical, managerial, and blue-collar jobs.

There is also an intensive margin--the amount of information obtained on each candidate and the care with which that information is used to make selections. The firm's search intensity is determined by a variety of policies and practices that regulate the selection process: the information requested on the job application, whether references are called; whether school transcripts or examples of previous work are requested; the number and length of interviews, and the existence and nature of medical, psychological, or skill examinations. A reasonably good proxy for the intensity of search is given by the total number of hours spent by company personnel in recruiting, screening, and interviewing divided by the number of applicants for the position. The fourth column of table 1-1 indicates differences across industries and occupations in this indicator of intensive search. Total hours spent recruiting, screening, and interviewing applicants is given in the fifth column of the table. It is an estimate of total direct hiring costs and thus reflects both the extent and intensity of search. There are important differences across occupations in

TABLE 1-1

INTENSIVE SEARCH, EXTENSIVE SEARCH, AND HIRING COSTS

	Applications per Offer	Interviews per Offer	Applications per Interview	Hours Spent per Applicant	Total Hours Spent	Number of Employers	Number of Employees per Employer
Industry							
Mining and agri.	5.64	2.56	2.07	1.48	6.98	42	131
Construction	5.06	3.99	1.76	2.69	8.23	154	38
Manufacturing	13.18	3.97	8.75	2.03	11.64	275	167
Transportation and utilities	10.55	4.41	2.67	2.51	12.42	96	94
Wholesale	8.79	6.19	1.57	2.58	12.81	221	45
Retail	8.12	4.37	2.36	1.53	7.25	712	41
Fin., ins., and real estate	8.04	4.45	1.86	2.61	11.10	165	69
Other services	8.31	4.50	2.17	2.29	10.97	599	46
Total	8.69	4.48	2.93	2.09	9.87	2264	64
Occupation							
Professional or technical	7.03	4.28	1.58	3.34	15.71	183	64
Managerial	7.80	4.05	2.24	3.43	16.99	85	74
Clerical	10.22	5.81	1.98	2.10	12.90	539	66
Sales	9.64	5.19	2.18	2.05	10.60	308	39
Service	8.54	3.86	2.99	1.48	6.30	427	57
Blue-collar	7.77	3.66	4.35	1.99	7.08	722	75
Total	8.69	4.48	2.93	2.09	9.87	2264	64

Note: Since means reported are arithmetic means, the product of the mean of hours spent per applicant and the number of applicants per hire does not necessarily equal the mean of the direct cost of hiring even if there was only one employment offer made. Note also that for the same reason, the product of the means of interviews per hire and applicants per interview does not equal the mean of applicants per hire.

the intensity and total costs of search. Employer search is much more intense and costly for professional, technical, and managerial jobs, and least intense and costly for service and blue-collar jobs.

Models explaining the ratio of applicants to interviews, the ratio of interviews to offers, the ratio of hours invested to applicants, and total direct costs (hours spent per offer) were estimated. Explanatory variables included employment size of the establishment and firm, measures of the flow of phone and in-person contacts, temporary or seasonal nature of the job, amount and type of training required for the job, physical capital required to perform the job, unionization, measures of indirect hiring costs, degree of difficulty of dismissal, and occupation.

Large employers were expected to engage in more extensive and intensive search for two reasons: (1) their marginal cost of search is lower because the screening and interviewing function is specialized; and (2) the dispersion of possible outcomes and, therefore, the payoff to search is greater because monitoring and dismissal costs are higher in large establishments and in multiestablishment firms. The evidence indicates that large firms do engage in more extensive search: establishments with 10 times as many employees review 19 percent more applicants per interview and conduct 17 percent more interviews to fill a position. Multiestablishment firms conduct 28 percent more interviews to make one offer than single establishment firms.

Firms that have many job seekers, phoning or visiting them seeking employment, have lower marginal costs for extensive search because it lowers the expected time that a position is vacant if the employer chooses to wait for an additional applicant. As expected, increases in the flow of people contacting the firm seeking work increased, extensive search. A doubling of phone contacts and in person contacts increased the number of applications reviewed per interview by 4 percent and the number of interviews per offer by 3 percent. An increase in the number of visits often reduced the time spent per applicant or per interview, however. The reduction in the cost of extensive search causes extensive search to be substituted for intensive search.

There are a number of reasons why employers can be expected to be more careful when they are filling a job that requires a great deal of on-the-job training. First, much of the training will inevitably be specific to the firm

so the cost of turnover will be high and it will pay to seek workers who are unlikely to quit or be dismissed. Second, the distribution of job applicant expected productivities is likely to be more dispersed because some of the job seekers will already have received related training at school or in other firms. Both of these factors raise the returns to employer search. These hypotheses are strongly supported by the data. A doubling of the total amount of training increases the number of interviews per offer by 16 percent and the time spent per applicant by 19.7 percent. The number of applications reviewed per interview are not affected by the amount of training.

Larger physical capital inputs utilized by a worker may directly affect the value of labor services just as the amount of training does. As expected, the greater the expense of the machine the individuals work on or with, the greater the time employers devote to recruiting, screening, and interviewing applicants. Interestingly, the 3 percent increase in direct hiring costs associated with a doubling of the cost of the machines worked on or with occurred because of an increase in intensive search (i.e., in hours spent per applicant). The number of applicants seen was not significantly affected.

The benefits of additional search (both extensive and intensive) arise in part because of the avoidance of mistakes, such as the hiring of an individual whose productivity does not exceed the compensation package promised. If it is difficult to fire a new employee, these mistakes are more costly; as a result, employers will choose more extensive and intensive search prior to hiring. This prediction is confirmed by the evidence. Employers who state that a great deal of documentation or paperwork is required to fire an employee incurred 70 percent greater direct hiring costs, which reflects a 21 percent increase in hours spent per applicant, and a 35 percent increase in applicants per employment offer. Employers who stated that some but not a great deal of documentation or paperwork is required to fire an employee incurred 52 percent greater direct hiring costs, which reflects a 22 percent increase in hours spent per applicant, and a 21 percent increase in the number of applicants per employment offer.

The expected tenure and intensity of an employment relationship clearly affect the marginal gain from additional information on potential employees. Thus it can be predicted that positions which are temporary or seasonal in

nature and positions that are part-time would be ones for which employers choose less extensive and intensive search. As expected, the number of hours spent per person hired was 36 percent lower if the position was a temporary one, reflecting a 16 percent drop in intensive search (hours spent per applicant) and a 26 percent drop in extensive search (the number of applicants interviewed per offer). Similarly, the number of hours spent per person hired was 22 percent lower if the position was part-time. However, this was due mainly to a drop in the hours spent per applicant. The number of applicants per offer was essentially unchanged, as a fall in the number of applicants interviewed per offer was offset by an increase in the number of applicants per interview.

Having advance notice of a vacancy will presumably reduce the indirect costs of extensive search for the employer, since for a portion of the search time there is no cost to seeing an additional applicant because of the existence of an unfilled vacancy. On the other hand, if the employer has multiple openings, this suggests a greater marginal cost to intensive as well as extensive search. The greater cost for intensive search can be attributed to rising costs for time devoted to hiring activity by company personnel. As expected, advance notice of a vacancy raised direct hiring costs (though the implied sum of direct plus indirect hiring costs was lower), specifically because it raised extensive search (in this case, both the number of applicants seen per interview and the number interviewed per offer were greater). On the other hand, while the existence of multiple openings reduced direct hiring costs, this reflected a fall in the hours spent per applicant.

WHY DO EMPLOYERS PREFER INFORMAL RECRUITMENT MECHANISMS?

Employers seldom invest in all of the recruitment channels that are available to them. Their decisions about which recruitment channels to emphasize are heavily influenced by their beliefs about where they are likely to find the best workers. Many employers also feel that who made the referral and how the applicant came to hear of the job helps in making a selection amongst the candidates that are interviewed. As a result, even after an application is made, the decision to interview a particular candidate and the selection for hiring may be influenced by who referred the applicant.

These beliefs were put to an empirical test by comparing individuals entering the same job at the same firm who were recruited from different sources. Four questions were explored.

- Is the time required to train new employees associated with the source of their recruitment? If yes, which groups require less training?
- Is the reported productivity of new employees associated with the source of their recruitment? If yes, which groups are more productive?
- Is the wage paid new employees associated with the source of the recruitment? If yes, which groups get the higher wages?
- Does the firm obtain greater profits if it recruits workers from one source rather than another? In other words, is the productivity net of training, recruitment, and wage costs consistently higher for new hires obtained through certain recruitment channels? If yes, which recruitment channel seems to be most profitable?

Theory

The theoretical and empirical issues raised by the first three questions are quite different from the issues raised by the fourth. "Yes" answers to the first three questions are quite consistent with a perfectly competitive labor market where all skills are general and information is costlessly available to everyone. The data suggest that it is not uncommon for people in the same job with the same tenure to receive different wage rates. If the firm can offer different wage rates to different new hires, a perfectly competitive labor market is quite consistent with substantial differences in the expected productivity of the new employees hired for a specific job. If employers' beliefs are correct about the correlation between recruitment channel and productivity of the sample of job seekers that contact them, this same correlation will appear when different workers hired in the same job are compared. Perfect competition implies that the more productive groups will receive higher wage rates and that the higher wage will exactly offset the higher productivity net of training and recruitment costs. If a firm has a policy of <u>not</u> varying the wage rates paid to people in the same job, then perfect and costless information and the absence of specific human capital imply that everyone hired by the firm has the same present discounted expected productivity net of training and recruitment costs.

Labor markets, however, are not perfect. Skills are often specific to particular employers, and information about the competence of job applicants is incomplete and costly to obtain. In firms that pay the same wage to everyone, circumstances may, therefore, arise whereby employees recruited from one

source (e.g., referral by another employer) are on average more productive than other employees who do the same work and were recruited from another source (e.g., the state employment service). In firms that adjust the entry wage to the perceived competence of the worker, the productivity net of wages, recruitment, and training costs may vary systematically with the recruitment source of the worker.

What kinds of market imperfections can produce variations in the profitability of new hires that are predictable according to the recruitment source of the new hire? The short answer to the question is imperfections that produce a correlation between recruitment source and the employer's monopsony power in hiring that specific individual. Competition forces the firm to offer each worker a compensation package that is at least equal to what the worker can obtain from other firms. A worker with characteristics that are visible to many employers that predict higher productivity in many firms will inevitably receive higher compensation. A worker with characteristics that predict higher productivity in a specific firm but not other firms, or with positive attributes that are visible to only one or two employers, may not receive appreciably higher compensation, and thus may provide the firm an opportunity to receive a profit.

If the recruitment source that yields an applicant is correlated with that individual having a comparative advantage at the jobs in that firm, the result will be a systematic tendency for the recruitment source to relate to the profitability of a new hire. An individual may find a comparative advantage in working at particular firms for a number of reasons.

- A job applicant might already know skills specific to the firm, possibly because of previcus employment at that firm or a similar firm, or from being a relative of a current employee.
- A job applicant might have a comparative advantage in learning skills that are specific to the firm, possibly because he or she knows the trainer already.
- A job applicant might enjoy the job more because he or she will be working with relatives and friends and this might result in a higher propensity to stay at this firm. (The effect of recruitment mechanism on turnover is not examined in this study.) Another effect of enjoying the work more might be that the employer can pay a low wage to the new hire.
- A job applicant might have special compatibility with other team member (presumably resulting in greater productivity) possibly because of similar ethnicity or existing friendships with current employees.

The second reason for systematic variation in the profitability of new hires would be the availability to the firm of information about applicants from a particular recruitment source that is not available to other employers contacted by the applicant. Such information allows the employer to make a more refined choice among applicants: avoiding the losers and hiring the winners without having to pay extra. When an employer gets a referral from a current employee or another employer, the person hiring normally receives information about the job applicant that is not available to other employers. As a result, the theory predicts that these new hires will typically be more profitable than other new hires. The state employment service and schools treat all employers equally, so one would not anticipate that hiring such referrals would have this profit advantage for the firm.

Results

Predictions generated by the theory just outlined can be tested by estimating models that characterize how the differences in the training required, reported productivity, and wage rates of two new hires in the same job are affected by the source of recruitment of these new hires. Such predictions do not imply a rejection of a perfect labor market in relation to the impact of recruitment source on the levels of training, reported productivity, and wage rates. They are as follows:

- New hires referred by a union will receive higher wages and be more productive and less costly to train.
- New hires obtained from an expensive referral source (i.e., private employment agencies) will either be more productive, less costly to train, or paid lower wages.
- New hires obtained by referrals from government agencies and schools will be less productive, more costly to train, and paid less.
- New hires referred by another employer will be more productive, less costly to train, and paid more.
- New hires referred by a current employee or who are friends or relatives of a current employee will be more productive and less costly to train.

The results showed that new hires referred by a union received significantly higher wage rates (52 percent for the starting wage), were reported to be significantly (55 percent) more productive in the first 2 weeks, and took

significantly (35 percent) less time to train than walk-ins who were hired to do the same work. Employer referrals took significantly (13 percent) less time to train, were 8 percent more productive in the 3rd through 12th week and were paid 7 percent more at the time of the interview. About 30 percent of those hired were friends of the owner or a current employee, and 11 percent were relatives of the owner or a current employee. Friends were reported to be 4 percent more productive during the 3rd through 12th weeks of employment, and 4.4 percent more productive at the time of the study interview. Training time was 4 percent lower and current wage rates were 1.7 percent higher for these employees, but the differences were not significant at the 10 percent level. The only statistically significant effect of being a relative of the owner or a current employee was that wage rates were 5 percent lower.

About 3.7 percent of the new hires had been referred by a school, and another 4.2 percent had been referred by the employment service, CETA, a welfare agency, or the Urban League. The measured effects of being a referral from one of these agencies had the predicted signs in 12 of 14 comparisons. Compared to a walk-in, the productivity net of training costs was 12 percent lower ($p = .133$ on a one-tail test) for school referrals and 14 percent lower ($p = .109$) for employment service referrals.

One of the most interesting findings of the study is the flat rejection of hypotheses about the effect of private employment agency referrals. Such firms generally charge a substantial fee, so it was expected that their referrals would be more productive, require less training, and receive lower wages. Point estimates, however, flatly contradict the first two hypotheses. Agency referrals were reported to be less productive in the first 3 months and to require more training.

The predictions that are unique to the imperfect labor market elements of the theory related to the profitability of a new hire (the difference between productivity net of training costs and the wage) are as follows:

- Union referrals will be less profitable (here it is assumed that some firms are being induced to hire a union referral by threats of a strike).
- Employer referrals will be more profitable.
- Referrals by current employees or friends and relatives of current employees will be more profitable.

- Employment agency referrals will seem to have higher productivity net of wages and training costs. Since the fees paid these agencies are not subtracted, the true profitability of the recruitment source is considerably lower than the measure available.
- Referrals by a government agency will be less profitable.
- Referrals by schools will be less profitable.

The only prediction of the imperfect labor market theory that was rejected by the data was about referrals from private employment agencies. Point estimates imply that such referrals were less profitable by an amount equal to 5.3 percent of the productivity of a worker with 2 years of tenure. The hypothesis that employment agency referrals are sufficiently more productive to warrant a fee of 10 percent of wages was rejected by the data.

The impact of referral source on the profitability of a new hire during the first 3 months (relative to the productivity of a worker with 2 years tenure) was as follows:

Union referral	-29.7 percent (p=.069)
Employer referral	7.1 percent (p=.13)
Friend	2.1 percent (p=.27)
Relative	2.5 percent (p=.305)
School referral	-3.6 percent (p=.26)
Government referral	-8.7 percent (p=.075)

The union referral and employment service referral effects are significant at the 8 percent or better level on a one-tail test, and the employer referral effect is significant at the 13 percent level. The other effects had lower statistical significance. These results are moderate support for the theory developed at the beginning of the discussion.

ON-THE-JOB TRAINING/SORTING

Every year employers and employees jointly invest a massive amount of resources in on-the-job training (OJT). Despite the importance, however, little is known about its magnitude, distribution, and effects. The training received on a job is part of the understanding (the implicit contract) that defines the nature and compensation of the job. A theory is developed of the determinants of investment in on-the-job training and the compensation package that distributes the costs and returns of the training. The theory assumes that there are (1) two distinct types of skills, general and specific, that

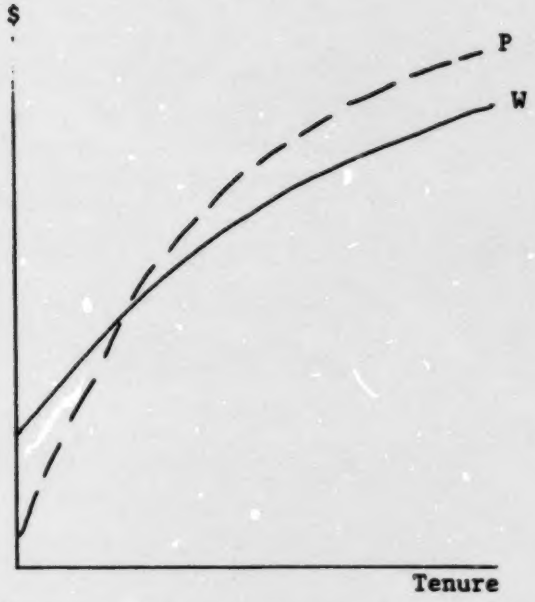
are produced jointly; (2) the training firm can accurately measure the amount of general training received by its worker but other firms cannot; (3) workers are not able to borrow money at as attractive rates of interest as their employers (consequently, they make choices between alternative job opportunities placing a very high value on receiving compensation now rather than later); and (4) the compensation offered by a firm has a bigger effect on job seeker's decisions to take a job than on whether to quit a job at a later time. These assumptions about the environment in which training and compensation decisions are made are combined with a model of competitive labor market. We get the following predictions about time pattern of compensation.

- Employers bid for new employees by offering front loaded compensation packages. (Compensation packages like those depicted in 3-1 or 3-4.) Since most workers have a stronger desire to have a dollar now rather than later, the firm in effect uses its borrowing power to offer new employees a wage package that pays in advance of performance. Moving allowances are a clear example of this phenomenon, but the same thing is also accomplished by offering higher starting wages and raising wages with tenure by less than the rise in productivity net of training costs. The tendency of firms to front load compensation is greatest when quit rates are not very responsive to the second period wage, and when there is a big difference between the worker's and the employer's ability to borrow.

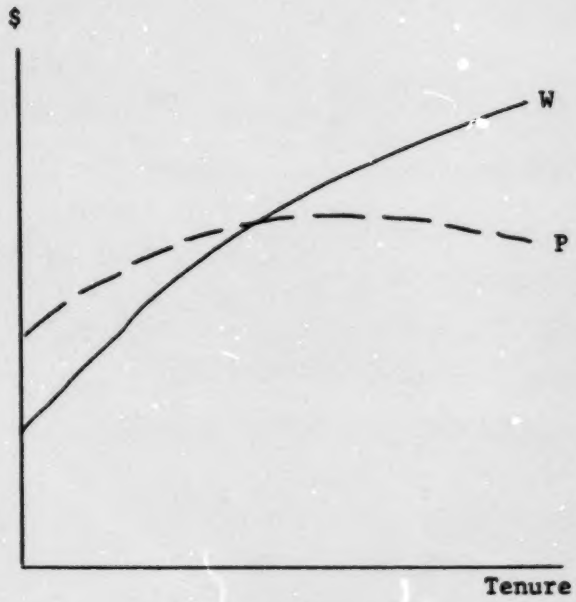
- Compensation tends to be front loaded if the people who stay at a firm tend to find that the attractiveness of alternative jobs falls with tenure on their current job. The factors that have this effect are costs of job search or job changing; an underestimate by other employers of the amount of general training received; and the tendency of those with the better alternatives or the greater dissatisfaction with their current job to leave, and of those with less attractive alternatives and greater satisfaction with their current job to stay.

- Front loading of compensation is greater when the second period wage has a greater proportionate impact on the probability and the employer will keep a worker that he or she has on the probability the worker will want to stay (i.e., choose not to quit).

- Anything that raises productivity in the firm, but does not raise it outside the firm, will raise the wage in the second period, but not by as much as productivity at the firm increases. Two factors that will produce this effect are training that is specific to the needs of the employer (and not useful to other employers) and the ability of the firm to fire the least productive employees. Here again the result is a front loaded wage package.

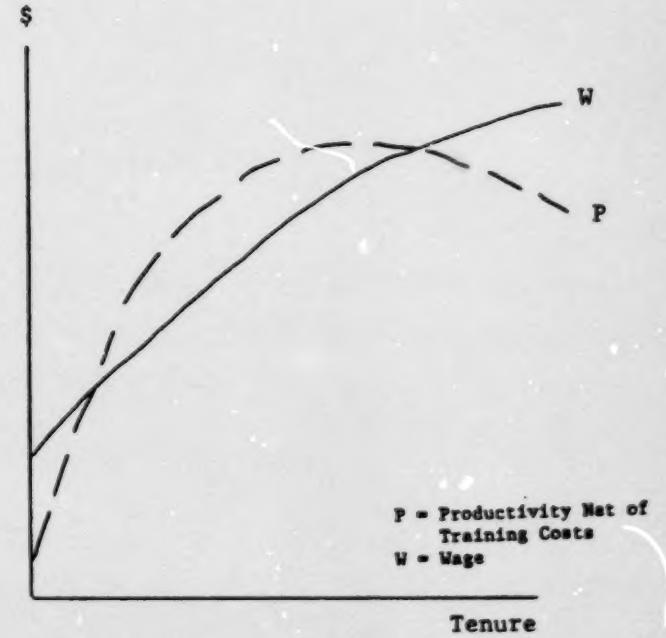


3.1 Front load compensation (Specific Human Capital)



3.3 Back loaded compensation (Lazear's Agency Theory Medoff and Abraham)

3.2 No load compensation (General Human Capital Salop and Salop)



3.3 Front and back loaded compensation (Bishop and Kang combined with Medoff and Abraham)

Figures 3-1 through 3-4. The time pattern of compensation and productivity net of training costs: alternative views.

- General training, which raises productivity equally both in and out of the firm, results in wages rising along with the rise in productivity net of training costs as in figure 3-2. Posttraining wage rates will have to be higher and starting wage rates will consequently be lower.

The Consequences of a Front Loaded Compensation Package

A front loaded compensation package means that at first the firm is investing more in training and in learning about the new employee's productivity. Later in the worker's tenure, these investments pay off and the employee's output exceeds the wages paid. If the worker quits before the return from the investment is recouped, the employer loses money on the hire. As a result, employers offering front loaded compensation packages will tend to give hiring priority to job applicants who are not likely to quit. An employer whose wage structure closely tracks the average increase in the productivity of new employees will tend to give hiring priority to job applicants who look like fast learners. While front loaded compensation causes the firm to try to select employees who will not quit, it tends to increase the propensity of those it does hire to quit. Which of these two influences is more powerful depends on which of the factors mentioned causing the compensation package to be front loaded.

The theory predicts that most compensation packages will be front loaded, or in other words that wage rates will rise more slowly than productivity net of training costs when training is entirely general as in figure 3-1 or 3-4. This prediction contrasts with the predictions of Becker's theory of general human capital, Lazear's agency model, Jovanovic's sorting model, and Salop and Salop's self-selection model. These models all predict that when training is general that wage rates will rise at a rate that is at or above the rate of growth of productivity net of training cost as in figure 3-2 and 3-3. Data from a sample of 1,493 recently hired workers from the National Center's 1982 survey of employers on training, reported productivity, and wage rates during the first 2 years of tenure on a job were used to test these competing theories.

Employers were asked "How many of the skills learned by new employees in this job are useful outside of this company?" Fifty-nine percent responded "almost all," 13 percent responded "most," and only 7.5 percent answered

"almost none." This question provides us with an independent direct measure of the generality of the training provided by a firm. It allows us to test our hypotheses about relative rates of growth of wage rates and training in a sample of jobs that require highly general skills. The employers were next asked how many other local firms made use of the general skills that were developed in their training. This question allows a further refinement of our classification of jobs. The jobs that offer the most general skill training are defined to be those reported to have "almost all" of their skills useful at other firms and 16 or more other firms in the local labor market that in fact use these skills. Data for these jobs are presented in the first column of table 3-1. The other column of the table presents data for the jobs where almost none of the training was useful in other firms.

The first two rows of the table present mean ratios of starting to current or second year real (inflation adjusted) wage rates. The wage increase in jobs offering almost no training in skills that are useful at other firms was so small that the inflation adjustment meant there was no increase in the real wage. The lack of any wage progression with tenure in these jobs suggests that employers pay for and receive almost all the benefits of specific training. The workers in jobs with the most general training seem to receive a real wage increase of 5 to 7 percent.

The second panel of table 3-1 reports answers to questions about the number of hours devoted to four distinct training activities. Training for jobs with the most general training and many local competitors involves an average of 49 hours watching others do the job, 9.6 hours in formal training, 52 hours in informal training by management, and 25.6 hours in informal training by co-workers in the first 3 months. The time devoted to training has a value equivalent to 147 hours of an already trained co-worker's time. Jobs reported to teach almost no skills useful in other firms (i.e., have training that is completely specific to the firm) requires less training--118 rather than 147 hours in the first 3 months.

This training seems to have the hoped for results of increasing the productivity of new employees. The third panel of the table presents ratios of the reported productivity of new employees to the reported productivity of those with 2 years of tenure. During the first 2 weeks, the typical new

TABLE 3-1

TRAINING, WAGES, AND PRODUCTIVITY OF TYPICAL NEW EMPLOYEES BY GENERALITY OF SKILLS TAUGHT

	Number of Skills Useful Outside This Company	
	Almost All GT 16 other firms	Almost None
Real Wage Rates		
Ratio starting/2 years (Typical)	.93	1.00
Ratio starting/current (Actual)	.95	.98
Hours Spent in Specific Training Activities in First 3 Months		
Watching others do the job	49.0	27.6
Formal training programs	9.6	7.9
Informal training by management	51.9	41.0
Informal training by coworkers	25.6	27.1
Investment in training time	147.1	118.0
Reported Productivity		
Ratio first 2 weeks to 2 years	.60	.64
Ratio next 10 weeks to 2 years	.79	.83
Ratio of Productivity Net of Training Costs in First 3 Months to Productivity of a Worker with 2 Years Tenure		
Liberal assumptions	.46	.55
RP (true) = 0	.72	.77
Conservative assumptions		
RP (true) = RP (meas)	.55	.62
RP (true) = .5 RP (meas)	.67	.72
RP (true) = 1.5 RP (meas)	.42	.52
Number of cases	557	114

Note: Sample is limited to jobs for someone hired less than 2 years earlier and for which all the necessary questions on wage rates, training time, and productivity were answered. Calculation of ratios of real wage rates assumes that a 7 percent inflation adjustment.

employee at firms offering general training is reported to be only 59-60 percent as productive as the typical worker with 2 years of tenure and experience. During the next 10 weeks at the firm, the typical new employee's productivity is reported to be 79 percent that of a worker with 2 years of tenure. As one would expect, the reported productivity of new employees increases more rapidly in the first month or so than it does later.

The bottom panel of table 3-1 presents estimates of the ratio of productivity net of training costs in the first 3 months of employment to the productivity of a typical worker with 2 years of tenure in the firm. The sensitivity of these estimates to the assumptions about the scaling of the productivity index can be examined by comparing the rows. Our preferred estimates, those calculated using conservative assumptions, are in the third row of the panel. The conservative estimate is obtained by subtracting the value of time expended by others--management and co-workers--from the estimate of the new worker's productivity. The liberal estimates of productivity net of training costs assumes that the trainee produces no current output when receiving formal training or watching others do the work, and, therefore, subtracts the value of the trainee's time devoted to formal training or watching others do the work from the previously described conservative estimate of productivity net of training costs. The estimates are presented in the first row of the bottom panel. The second row of the panel presents estimates based on the extreme assumption that productivity per hour engaged in a non-training activity does not increase during the first 2 years on the job at all.

The fourth row of the panel presents estimates that are based on the assumption that the reports of productivity differences supplied by our respondents exaggerate true proportionate differences in productivity by a factor of two. The fifth row of the panel presents estimates that are based on the assumption that proportionate differences in true productivity between new and experienced workers are 50 percent greater than those reported.

These figures were then adjusted for the possibility that compensation rises faster than wage rates and for the fact that the time others spend training the new employee during year two were not included in the calculation of the denominator. Our central hypothesis--that productivity net of training costs rises more rapidly than compensation during the first 2 years in a job,

even when the training is reported to be completely general, was then tested under a variety of maintained assumptions about the appropriate scaling and measurement of productivity net of training costs.

These tests produced a decisive rejection of the hypothesis that the rates of compensation for jobs reported to offer completely general training rise at a rate that is equal to or greater than the rise in productivity net of training costs. The finding that in the first 2 years of tenure compensation rises less rapidly than productivity net of training costs is quite robust. If compensation rises no more than 5 percent faster than wage rates, the hypothesis is rejected even when we make the truly extreme assumption that, although respondents report to the contrary, there is no increase in worker productivity in the first 2 years on a job. If compensation increases 10 percent faster than wage rates, the hypothesis is rejected even when it is assumed that the true increase in relative productivity with tenure is only half of what was reported by our respondents.

These results can be viewed as evidence that in the first year or so on a job, the forces tending to cause wages to grow more slowly than productivity net of training costs are stronger than those having the opposite effect. Thus even when the training is reported to be general the wage productivity profile is depicted in figure 3-1 or 3-4. The forces that tend to cause starting wage rates to be higher than productivity net of training costs, and therefore wage growth to be slower than the growth of productivity net of training costs, are workers needing and wanting income more strongly now rather than later, than firms and sources of job-worker match specificity such as sorting, costs of transfer, specific training, and extra general training that is not recognized by others in the labor market. The forces that work in the opposite direction are the need to design wage structures to attract those with low quit probabilities (Salop and Salop 1976), and to reduce shirking (Lazear 1981). The great deal of specificity to job-worker matches that is implied by these results means that turnover is extremely costly for the worker, the firm, and society.

The Training Decision

The theory also makes some important predictions about the determinants of investment in on-the-job training:

- Firms and workers will invest more in general and/or specific OJT when interest rates are low, when tax rates on the returns to the investments are low, when separation rates are low, when other employers recognize the value of improvements in the quality of a firm's training, when costs of investment are deductable in the year incurred, and when tax rates during the investment year are high.

- Decisions about the provision of specific human capital depend upon the tax rates faced by the firm and the interest rate the firm must pay to borrow money. The fact that the costs and benefits of specific human capital investments are shared does not mean that decision making about the amount of specific training is shared. The interest rate the employee must pay to borrow money and his tax situation does not affect the decision.

- When general OJT is perceived accurately by all potential employers, the worker must finance all its costs and it is the interest rates and tax rates faced by the worker, not the firm, that determines whether the investment is undertaken. The impact of these factors on the level of general training is similar to their impact on a young person's decision to remain in school. The primary difference is that generous low interest loans are not available to finance employer-provided general training, as they are for attending institutions of postsecondary education.

- When the quality of general OJT provided by an employer is not accurately perceived by other potential employers, the costs and benefits of the training are shared between employer and employee. Decision-making authority over the amount of training is also shared. The level of investment is influenced by the rates of interest and taxation faced by both the employer and the employee.

- Workers and firms tend to underinvest in general training. This occurs for four reasons.

  --The worker's discount rate (the rate at which the worker can borrow and therefore trade off future consumption for current consumption) is considerably higher than the social discount rate (the interest rate on government bonds).

  --The tax rates faced by the worker when the returns to the investment are being received are typically higher than the tax rates when the costs are being incurred.

  --Other employers do not accurately perceive the quality of the general OJT received by the worker, and as result do not fully compensate the trained worker even if he or she receives good training.

  --If a minimum wage constraint is binding, the starting wage on a job will have to be higher than it would otherwise have been and this increases the cost of training and thus reduces its amount. A second impact of the minimum wage is that the rise in the starting wage is partially compensated for by a fall in the wage rate in the posttraining period. This increases the quit rate, which in turn reduces the payoff to training and therefore the amount of training.

If the interest rates facing employers are higher than the social discount rate, there will also be underinvestment in specific training. The degree of underinvestemnt in specific training is considerably smaller than the underinvestment in general training.

From the point of view of public policy, the most important conclusion from the economic analysis of on-the-job training is that from society's point of view, employers and employees underinvest in general on-the-job training. There is a good deal of empirical evidence supporting this finding. If there is underinvestment in general OJT, we would expect to find private rates of return to OJT to be very high. The studies that have estimated the return to OJT do find that rates of return are very high. Harvey Rosen (1982) found, for instance, that after adjusting for inflation the real rate of return to OJT investments by the worker was 12.6 percent per year for those who went to college and 19 percent for those who did not attend college. These rates of return are considerably higher than the real rates of return of about 4 percent on corporate bonds and of about 5 percent for schooling. Mincer (1974) estimated the rates of return to be even higher.

The data presented in table 3.1 also supports a conclusion that total rates of return (combining both worker and employer benefits and costs) to OJT in the first few months of employment are extremely high. Our respondents report that in the third through twelth week of employment productivity is 16 percent higher on average than in the first two weeks. Since the training that produces this dramatic increase in productivity is occurring over the course of only two months, the calculated costs of this training are not likely to exceed two months of output from the new worker. If so the average rate of return to this training exceeds 100 percent. The employers we interviewed reported that over the course of the next 21 months up to the worker's second anniversary at the firm that productivity typically increases another 12 percent. Average rates of return on the training investments that produce this productivity gain will not be 100 percent but they are many times higher than the real rates of return to corporate bonds and schooling.

A different type of evidence for underinvestment in general on-the-job training is provided by Bishop's (1982) study of the social payoff to occupationally specific training. By comparing two new hires in the same job with

differing amounts of experience, he obtained the result that compared to zero experience 5 years of relevant work experience reduces the training required by 22 percent and increases productivity by 16 percent in the first two weeks, 11 percent in the next 10 weeks and 6 percent after about a year at the firm. The key finding is that these increases in productivity and savings in training costs are larger than the extra wages offered these workers. This means that on-the-job training at employer A not only benefits the employee and employer A (as implied by Becker's theory of OJT) but also benefits other employers in the industry who hire workers who quit or are laid off by employer A. In other words, OJT creates externality--a benefit that is not appropriated by either the trainer or the trainee. The market failure that is implied by this finding is justification for governmental efforts to stimulate the externality creating activity--general on-the-job training.

How might government induce firms and workers to increase investments in general on-the-job training? Four different approaches will be evaluated: (1) lower taxes on the returns that the employer receives from training investments, (2) lower taxes on the returns the employee receives from training investments, (3) subsidize the costs of training investments, and (4) abolish the minimum wage for jobs that offer considerable training.

The first two options are not viable because the returns to a training investment cannot be administratively distinguished from the returns to other investments, and general reductions in tax rates (both during and after training) do not increase the incentives to invest in training. It has been demonstrated both theoretically and empirically (Hashimoto 1982, Bishop 1982) that the minimum wage reduces general OJT so reductions in the minimum would increase general OJT somewhat. Eliminating the minimum wage would not however end or even significantly reduce the underinvestment in general OJT. The reason is that the minimum wage is a binding constraint for only a small minority of jobs, and even in its absence, underinvestment in general OJT would occur for a variety of other reasons.

This leaves us with a subsidy of the costs of general training as the only policy that might significantly increase general on-the-job training. Since general OJT typically gets mixed together with specific OJT, and both occur simultaneously with actual production, the primary barrier to

subsidizing general OJT is finding a way to measure it. One way society can promote on-the-job skill training without having to solve the measurement problem is for community colleges (or some other public agency) to establish cooperative training ventures with specific local employers in which teachers on the college's payroll provide training that meets that employer's specifications, but is also useful at other firms. Many states and localities now offer this kind of aid to companies that open or expand plants in the community. Publicly subsidized institutions seem to be becoming increasingly important providers of skill training that is customized to a particular employer's needs. It is not clear, however, that publicly controlled institutions have a comparative advantage in this type of activity and that lacking the public subsidy they would be effective competitors in this market. If not, efforts to promote on-the-job skill training might better be focused on offering the subsidy to the worker or firm and letting them choose who shall provide the training.

An alternative way of encouraging collaboration is to offer subsidies to employers that offer training that is integrated with a school or college's curriculum (the Targeted Jobs Tax Credit offers such a tax credit for hiring disadvantaged high school cooperative education students). Another approach might be to offer young people leaving high school a voucher/scholarship that can be used to buy training from an employer as well as to pay college tuition. Still a third approach would be to offer a tax credit to employers that provide certain approved kinds of training. The major difficulty with the latter two approaches is that one cannot subsidize something one cannot measure, and measuring OJT is notoriously difficult. The measurement problem can be solved, however, and the final section of the paper presents two practical proposals of how on-the-job training might be subsidized.

Marginal Training Subsidy

A marginal training subsidy (MTS) would offer a partial subsidy of training expenditures above a threshold level. The rate of subsidy or tax credit would be set somewhere between 10 and 33 percent. The training costs that would be eligible for subsidy would include payments to industry training funds, tuition reimbursements for job-related training, contributions of

materials or staff time to vocational-technical institutions, the budgeted costs of the firm's formal training of new and continuing employees, and certain costs for informal training of new and upgraded employees.[1] Participating companies with more than 100 employees would be required to have a training advisory committee that contains worker representation.

While the measurement of the costs of informal training is difficult, it must be attempted if choices between formal and informal training are not to be distorted.[2] The subsidizable costs of informal training would be limited to trainee time and trainer time during the first year of employment or during the first 3 months before or after a major promotion and change in job responsibility. If the training is formal, certain additional expenses--books and materials, rental on teaching machines and equipment or office space dedicated entirely to training, and payments to training vendors--would be eligible for subsidy. Formal training would be subsidizable regardless of length of tenure and whether the worker is receiving a promotion. At the conclusion of the training program or the firm's fiscal year, the employer would be required to award each trainee a certificate describing the number of hours of formal or informal training provided/attended, skills taught and where appropriate, and the competence achieved.

The threshold which must be exceeded before a subsidy or tax credit would be paid would be equal to 10 percent of the firm or establishments wage payments to employees with less than one year of tenure at the firm plus 1.5 percent of wage payments to all other employees. The threshold is higher for firms with many new employees because (a) new employees tend to receive more training than continuing employees and (b) the costs of informal training are subsidizable only during the first year on the job and for a short period after a promotion.

A subsidy above a threshold has some important advantages over an obligation to spend a minimum amount on training:

- Firms that are big trainers (and therefore probably efficient trainers) of skilled workers would always face an incentive to expand their training.
- In France where there is an obligation to spend 1 percent of wage bill on training the great majority of employees work at firms which exceed their obligation to spend on training so at the margin, there is no public encouragement of additional training for the majority of French workers. A subsidy above a threshold avoids this problem.

- Paperwork is reduced because most firms would not apply for a subsidy in most years. Year-to-year variations in training expenditures are likely to be large at small firms. Such firms would most likely spend above the threshold only in years in which there is a major expansion of employment or the installation of new equipment.
- Employers who feel the administrative burdens of the subsidy are too high, are free not to participate.

All employers--profit making, nonprofit and governmental--should be eligible for the marginal training subsidy if their training expenditures exceed the threshold defined for their organization.[3] In order for incentive effects to be maximized, employers must feel they are assured a larger subsidy payment if they increase their firm's training investment. Together these two considerations imply that the MTS should be administered as a subsidy entitlement, as a tax credit against a broad based tax on the firm's wage bill like Federal Unemployment Insurance Tax or social security tax, or as a tax credit against income taxes that can be sold to other firms.[4] The MTS would be financed either out of general revenue or a special training tax on the wage bill of all employers. In order to give firms time to set up the accounting procedures to record training expenditures, it would be phased in at least a year after the legislation is passed.

The MTS has a number of important advantages:

- The social benefits of on-the-job training are probably just as large as the social benefits of occupationally specific training provided by schools. The MTS would create an incentive for firms and workers to generate more of such benefits, and would reduce currently prevailing distortions of the choice between these two modes of providing occupationally specific training.
- Since the employer pays 67 to 90 percent of the cost of training, there is always an incentive to do the training in the most efficient manner possible.
- The choice of which jobs to train for and how to do the training is made by the employer not by an educator, a government official, or by the trainee. The employer is the person best able to project the firm's future need for skilled workers and to select the best method of training for those skills.
- The inclusion of the costs of informal training in the definition of subsidizable training expenses is fair to small business, and reduces the tendency of the subsidy to distort choices between formal and informal training.
- While the MTS is not directly targeted on the unemployed dislocated worker, it will reduce unemployment nevertheless. The MTS reduces unemployment in two ways:

- It encourages firms to hire and train new workers, and to retrain rather than lay-off workers whose skills were becoming obsolete.
- It encourages the firm to expand the supply of skilled workers rather than engaging in a bidding war for the limited supply of already trained workers, thus producing an acceleration of inflation.

- The MTS should discourage turnover. A firm with high rates of turnover will have a higher threshold, and will as a result receive a smaller subsidy payment.

The MTS has as its objective expansion and intensification of on-the-job training. Only two small reforms of current practice are proposed--training advisory committees at firms with more than 100 employees and providing the trainee a certificate describing the training that has been received.[5] All the really important decisions--who is to be trained, what is to be taught, workers influence these decisions by bidding for jobs that require training, by selecting an employer who provides the desired training, and the commitment that is given to learning the material that is presented).

Employers and workers probably invest nearly $100 billion of time and resources in formal and informal on-the-job training each year. Consequently, covering all employers and all kinds of training inevitably means costs can be kept down only if the subsidy rate is set rather low, the definition of subsidizable expenditure is restrictive and the threshold is set rather high.

A Critical Skills Training Incentive

An alternative approach to promoting more private investment in on-the-job training is to target certain critical occupations that are experiencing severe shortages. A subsidy would be offered for training newly hired and/or transferred employees in a few selected occupations.

Selecting Skills for Which to Provide Training Incentive (SCTI). Legislation would restrict the subsidy to a limited number of industries that currently export a major share of their output, or are service firms that provide specialized high-tech services.[6] To be eligible for a training subsidy, an occupation/skill would have to involve considerable initial on-the-job training, be required at many firms, and be in shortage. The determination of whether an occupation is in shortage would be based on current data on changes in relative wage rates, changes in vacancy rates or

newspaper advertising if available, and on recent and projected growth of demand for the skill.[7] The Department of Labor would be given a fixed budget and empowered to select a limited number of skilled jobs for which training subsidies would be available.

Once an occupation had been selected as a potential candidate for subsidy the Secretary of Labor would appoint an industry/labor committee to make recommendations regarding the definition of the critical skill, the competencies that a trained individual would be expected to have, and possible mechanisms to insure that subsidized trainees achieve these standards. The Department of Labor would do a small survey of the costs of training and the length of the training period that would serve as a basis for calculations for median training cost.[8] The Secretary of Labor would be empowered to make competency certification (under the auspices of a multi-employer or union umbrella organization) a part of the mechanism for defining eligibility for a critical skills training subsidy.[9]

Administration of the Training Incentive. Application for a subsidy of a particular trainee must be made within one week of the start of the training (within one week of the date of beginning work in the case of a new hire).[10] The requirement of immediate application for the training subsidy has three purposes: (1) by forcing the firm to be aware of the subsidy when it begins the training, it maximizes the subsidy's incentive effect and reduces retroactivity, (2) it allows DOL to continuously monitor the number of trainees its program has stimulated, and to project future costs and the fullfillment of its goals, (3) for the firm it locks in the terms and conditions of subsidy that prevailed at the date training was commenced. If DOL determines that more (less) training is being undertaken than needed or was budgeted, it has the right without advance notice to restrict (liberalize) the definition of subsidizable jobs/skills, lower (raise) the training cost allowance or end that occupation's eligibility. Changes in rules would apply to all training programs begun one week or more after the announcement of the change.

There would be no limit to the number of trainees for which an employer could be subsidized, and the firm would not have to obtain advance agreement from DOL as to this number. The employer would only have to certify (1) that

the training he provides results in the worker's attaining the critical skill, and (2) that the trainees did not have that skill prior to the training. This certification would be audited on a random basis.[11] Workers who complete training would be awarded a certificate attesting to the skills they have achieved. The skills taught by the training program would be described in detail either on the back of the certificate or on an attachment.

The administration of this critical skills training incentive has been described in considerable detail for several reasons:

- the popularity of the program with employers will depend upon how easy it is for them to administer it,
- the power of the incentives it produces and the cost of the program may depend upon seemingly minor administrative matters (such as when application for subsidy must be made),
- the primary concern about proposals such as this is whether they can be administered, so there needs to be a demonstration of the feasibility of the program.

The plan described has a number of attractive features:

- It is limited in scope to occupations in critical shortage.
- Great flexibility is given to program administrators. (This is essential because the very concept of the program is new and because it must quickly respond to the changing needs of the economy.)
- Workers who complete training are awarded a certificate that describes the skills they have gained.
- The firm always faces a marginal incentive to expand its training of targeted skills. It does not have to get prior agreement from DOL about how many people to train (an administrative hassel that would be a major barrier to participation).
- The firm is given an incentive to retain the workers it trains.
- Despite the almost "entitlement" nature of the training subsidy, its total cost is capped by the monitoring of usage and DOL's ability to lower subsidy amounts and tighten eligibility.
- A sunset provision automatically ends a skill's eligibility for subsidy.
- Cost could be further reduced by requiring that firms already employing people in the targeted skilled occupations exceed a given level of training before being eligible for subsidy. It could be assumed that in the normal course of events such firms would have to replace 10 percent of their stock of workers with the targeted skills anyway. The subsidy could be paid for trainees above this threshold.
- The firm's administrative costs are kept low. The firm does not have to calculate and report how much it is spending on training.

- Eligibility for subsidy is a function of an output--the number of people trained for certain specific jobs--not a measure of input. This creates a strong incentive to be as efficient as possible in doing the training.

The critical skills training incentive has some important drawbacks, however. Its success depends upon the wisdom and timeliness of the selection of skills for which training subsidy is provided. Experience with federally funded graduate fellowships should remind us how difficult it is for government to forcast future demand for a specific skill and implement decisions to extend or withdraw training subsidies in a timely manner. Graduate fellowships were originally targeted on a few shortage fields thought to be critical to national defense. However, other fields campaigned to be included and new programs were started until almost every field of study was included in at least one agency's fellowship program. The number of fellowships expanded even after the shortages of Ph.D. holders that gave rise to the programs were replaced by surpluses. The CSTI has features--the sunset provision, great administrative flexibility, and a fixed budget--that are intended to prevent a recurrence of the poor timing that characterized the graduate fellowships programs. There is always the possibility, however, that the projections of future demand will be wrong, or that politics will result in the wrong occupations being selected and that the selective nature of the training incentive would increase rather than decrease market distortions.

FOOTNOTES

1. To insure that only training gets subsidized/not vacations or motivational sales meetings, subsidizable expenditures might be defined to exclude (1) travel to a remote site other than the company's national or the appropriate regional headquarters, (2) housing and food expenses of more than $100 a day, (3) costs of training non-employees, part time employees working less than 50 hours a month or employees for whom more than 50 percent of compensation comes from commissions, (4) payments to speakers or presenters of a training session of more than $1000 or $200 per contact hour which ever is higher. The costs of developing a training package or system for use in training ones own staff would be an allowable expense.

2. A trainee would be considered to be engaged in formal or informal training if he or she is receiving group instruction, being instructed by a computer, reading manuals or instruction booklets watching others do the work or being shown the work. A trainer, supervisor or coworkers time would be considered to be engaged in a training activity only if 100 percent of the trainers attention is devoted to the training purpose. If any output is produced during a training activity it would have to be given to the trainee, discarded or given away. The following tests could be used to define a promotion for purposes of calculating subsidizable training expenses: there would have to be a new job title, noticeably different job duties and a wage increase of at least 6 percent above the standard seniority or cost of living increment and the individual could not have held that particular job before. In order for new employee training to be subsidizable it would have to be associated with a wage increase by the end of that year of at least 10 percent over and above the rise in the cost of living.

3. To insure that employers who receive an MTS subsidy were aware of the program at the time it might influence their behavior, it could be required that the employees make a preliminary application before July 1 of the calendar year for which a subsidy is sought.

4. If the MTS is a subsidy, subsidy payments would be taxable income. If the MTS is a tax credit the firm would have to reduce its reported social security or FUTA tax payments by the amount of the tax credit.

4. To the extent that the accounting rules used to distinguish training activities from production activities affect the way training is conducted this is an unfortunate unintended consequence of the necessity of defining a dollar quantity of training expenditure for each firm.

5. Examples might be communications, machinery, instruments, chemicals, pharmaceuticals, electronics, computer service and R & D laboratories.

6. For a skill to be eligible, both recent and projected rates of growth would have to be high. Projections of future growth should be based on a methodology that can be updated on a quarterly basis and that uses contemporaneous market signals (such as current or forward prices of the industry's product, new orders, current industry sales or employment) to project future employment. The methodology must be capable of giving timely warning of

industry turn arounds like the one that occurred in 1981 in oil drilling and explanation. A projection of rapid growth would be sufficient on its own (in the absense of high past rates of growth) only if the evidence is particularly strong (e.g. Congressional passage of obligational authority for a huge multi year contract. Where classroom training at schools or colleges substitutes for OJT, information on the number of graduation of such programs (recent and projected) would have to be compared to growth of demand.

3. The survey would not be very costly and would not take long, once a sample of employers who have trained such workers was obtained. While visits to establishments by specialized staff would be the preferred mechanism, it could be done over the phone. A telephone interview approach to measuring on-the-job training costs for specific jobs has been developed by the National Center for Research in Vocational Education and implemented by the Gallup Organization at a cost of less than $75 per interview. The training costs that would be measured by this survey would include:

1) payments to outside vendors such as a training institution,
2) depreciation on machinery 100 percent devoted to training,
3) time of specialized training personnel that is spent in contact with the trainee or preparing lessons,
4) time of supervisors or coworkers spent giving formal or informal training to the non-worker above a 40 hour minimum,
5) time of the trainee that is spent in a formal or informal training activity that is not directly productive.

The survey would also serve as a basis for developing an operational definition of the job or skill for which training subsidies would be provided, and for the levels of the skills. The results of the survey would be reviewed by DOL staff and the industry/labor committee. DOL staff would make a formal recommendation to the Secretary which the advisory committee could endorse or take exception to as it wished. Training costs allowed in future years would be indexed to the economy's average hourly wage, so the survey would only need to be done once.

9. Systems for competency certification currently exists in construction, telecommunications, banking and a varitey of other industries. In some industries and occupations, an existing system(s) could be adopted "as is" or modified; in other industries and occupations a new system would have to be developed. Since an occupation is eligible for a critical skills training subsidy for only a limited period, a judgement would have to be made as to whether the benefits of competency certification would outweigh the inevitable costs and delays that such a requirement would impose. In addition, in certain fast changing fields codifying what must be learned in this way might not be desirable. There would be an expectation that the organization sponsoring the competency certifi cation after the end of the period of the occupation's eligibility. Conditioning the CSTI on the existence of competency certification would tend to encourage industry groups seeking designation of one of their job/skills as a critical skill to create a certification process for that job.

10. The application form could be quite simple, requiring only the name and social secruity number of the trainee, employer ID number, the training establishment's name and address, the firm's name and address, the skill for which

training is being provided, the trainee's wage, and a description of the job (including its wage) for which he/she is being trained.

11. An advance opinion as to the eligibility of a proposed training program (binding on DOL) would be available to employers who request it. The calculated amount of subsidy would be paid in equal semiannual installments over the training period that has been established for that skill. If the worker is employed at the firm for less than the full training period, the subsidy payment would be prorationed for the period he/she was at the firm. The payments would be taxable income. Training establishments would submit semi-annual bills to DOL for the subsidy payments due to it. The payment would be made to the training establishment (even when that establishment is part of a multi-establishment firm) because auditing would be carried out at the establishment level, and because the payment then shows up in the right place in multi-establishment firms with divisional profit centers.

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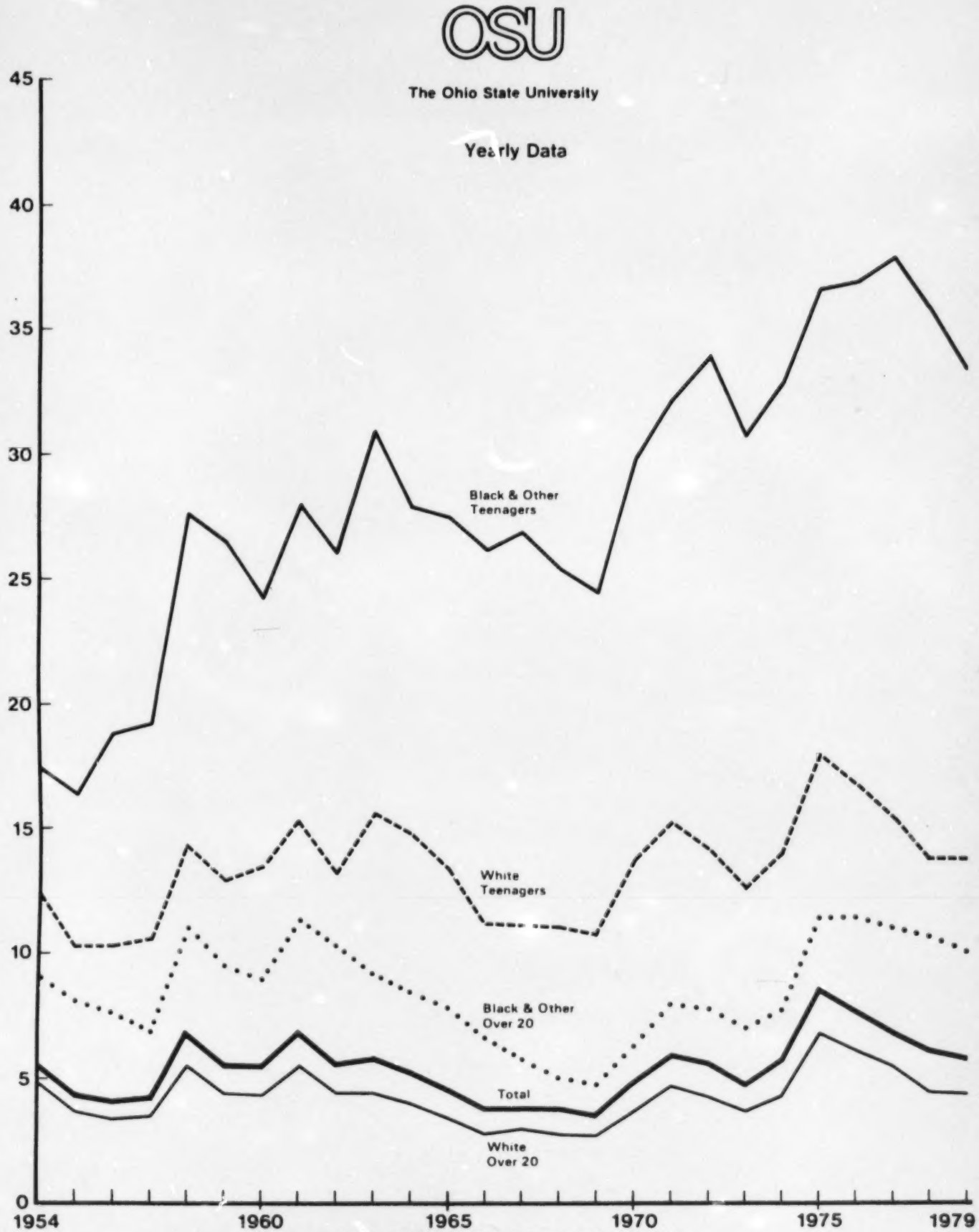

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